

**To:** Russell, Carol[Russell.Carol@epa.gov]  
**From:** Hestmark, Martin  
**Sent:** Mon 8/10/2015 2:44:44 PM  
**Subject:** Re: MSI responds to Gold King Spill

Thanks CARol we have them in the fold.

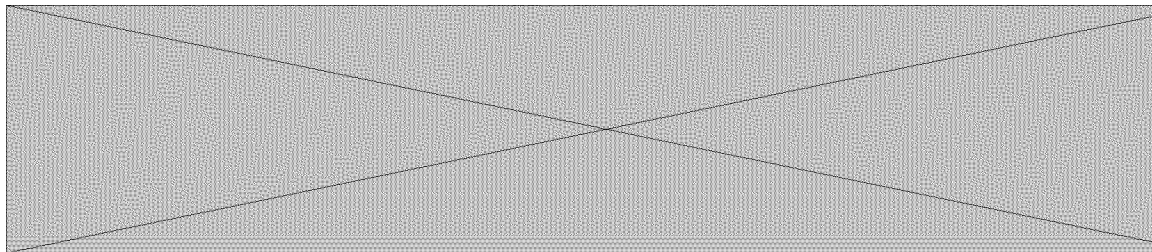
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**From:** Russell, Carol  
**Sent:** Monday, August 10, 2015 8:21 AM  
**To:** Hestmark, Martin  
**Subject:** FW: MSI responds to Gold King Spill

Just FYI- If you have not heard of them, they are a well-respected source of science in the Animas and the for other watersheds groups in the San Juans.

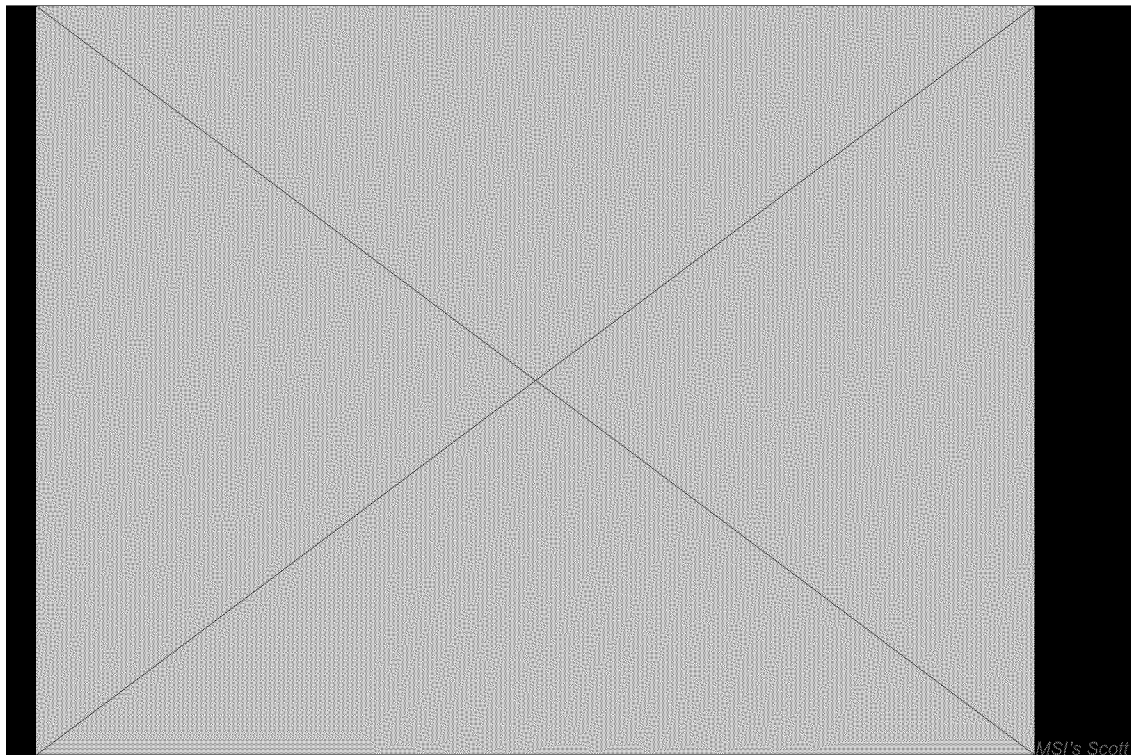
**From:** Mountain Studies Institute [<mailto:info=mountainstudies.org@mail183.wdc02.mcdlv.net>]  
**On Behalf Of** Mountain Studies Institute  
**Sent:** Saturday, August 08, 2015 7:48 PM  
**To:** Hutchinson, Marcella  
**Subject:** MSI responds to Gold King Spill

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# Early signs good for Animas River biology:

## Macro-invertebrates hanging on 20-hours after spill



*Roberts collects Invertebrates from the Animas River.*

MSI's Scott

Twenty hours after exposure to a plume of acid mine drainage the small insects that inhabit the Animas River—macro invertebrates—are still hanging on. Mountain Studies Institute (MSI) staff stepped up to study the water quality and aquatic life in the Animas River as the one million gallons of wastewater from the Gold King mine was heading towards Durango, Colorado.

Macroinvertebrates are excellent indicators of water quality and stream health. They have a wide range of eating habits, life spans, and tolerances to pollution. Due to their small size and habits, they have limited mobility. Unlike fish, they cannot swim away when disaster strikes or seek refuge in other streams. More than just indicators, macro invertebrates are the base for the food chain that supports all other aquatic life in the

Animas River.

MSI's preliminary results indicate that dominant benthic macroinvertebrate taxa in the Durango stretch of the Animas River survived the first twenty hours of exposure to the slug of water containing sediment and heavy metals from the Gold King mine.

MSI staff raced to collect data from multiple sites in the Durango area before polluted water arrived in the city limits. They established monitoring points at 32nd Street Bridge and near 15th Street collecting macro invertebrates before the plume arrived and 20 hours afterwards. MSI staff have historic data at the 32<sup>nd</sup> Street Bridge site that will enable them to compare this event with the long-term status and trends of the river.

"As soon as we heard about the release we began sampling and testing for water quality and invertebrates. We continued to take water quality samples every one-two hours as the release hit downtown" says Aaron Kimple, Program Director of Water Quality and Forest Health.

"We do not yet know how less dominant and larger sized taxa fared, such as *Pteronarcys* stonefly" cautions Roberts. INTRODUCTION, as the larger invertebrates are harder to collect. Full analysis of macro invertebrate community composition are underway.

MSI's findings mirror the Colorado Department of Parks and Wildlife's (CPW) results that fish have mostly survived the first 20 hours as well. CPW are monitoring fish in cages to see if the exposure to the slug of toxic sediment would kill the fish. However, the ability for fish to sustain after the plume of water has passed depends on their ability to find food—the insects—and to sustain any potential toxic metals that have been absorbed through their gills and skin.

"Continued monitoring may reveal substantial impacts to aquatic life over a longer period of time, but it is good news that widespread acute mortality did not immediately occur" says Roberts.

"There are two big picture items now as the plume passes through. First, we need to keep our eye on the long-term effects to the environment. The sediments that are being

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